Mission ACES

AMANDA, CARLOS, EMMA, AND SHANIA
CAMDEN MIDDLE SCHOOL
SOUTH CAROLINA
MRS. BULLOCK

Purpose of Mission ACES

We are going on Mission Aces to explore asteroid number 253 Mathilde. We would like to discover if life can possibly thrive on this asteroid. In addition to this, we would also like to study the basic needs of hygiene and exercise in space while on this mission.

Hygiene Importance and Challenges

- Hygiene is important because you are in a small space and don't want to carry germs that will spread diseases quickly.
- The challenge of hygiene in space is that you can't use water to clean yourself in the capsule because there is no gravity which causes the water to float around. Also, germs and infectious diseases spread quickly.

Hygiene Solutions

- Astronauts take a sponge bath to clean their body and use a no-rinse shampoo to wash their hair. When brushing their teeth, instead of rinsing with water and spitting into a sink, astronauts spit into a towel. They use a water-free toilet to get rid of solid waste. They position and secure themselves over the toilet seat using body restraints. The astronaut turns on a series of fans to purify the air and a vacuum is used to imitate gravity for the waste. When finished, they clean the toilet with wet wipes and dispose of them in a nearby container.
- To prevent germs and infectious diseases from spreading quickly, the eating utensils, dining area, toilet, and sleeping facilities in a space capsule are regularly cleaned. Dirty clothes, garbage, food containers, and used eating utensils are sealed in plastic bags.

Extra Information and Hygiene's Role

- It takes about ten minutes longer to use the bathroom in space than it does on Earth.
- Shaving in space is similar to shaving on Earth; astronauts just have to be careful not to let stray whiskers escape into the air. Astronauts shave with foam or an electric razor, but most prefer the latter, because it doesn't require water and automatically collects hair.
- While on short flights astronauts don't need a haircut, but on longer flights some astronauts need a trim. They cut their hair the same way as on Earth, but use a vacuum device so that stray hairs do not to float away.
- The role of hygiene in space is that it keeps astronauts healthy and alive while exploring space.

Exercise

- Exercise is important because you don't want to get overweight and be unhealthy. You also want to keep your muscles and bones strong because in space, astronauts lose muscle mass and bone density.
- The challenge of exercising in space is how to exercise in a small space without gravity.

Exercise Solutions

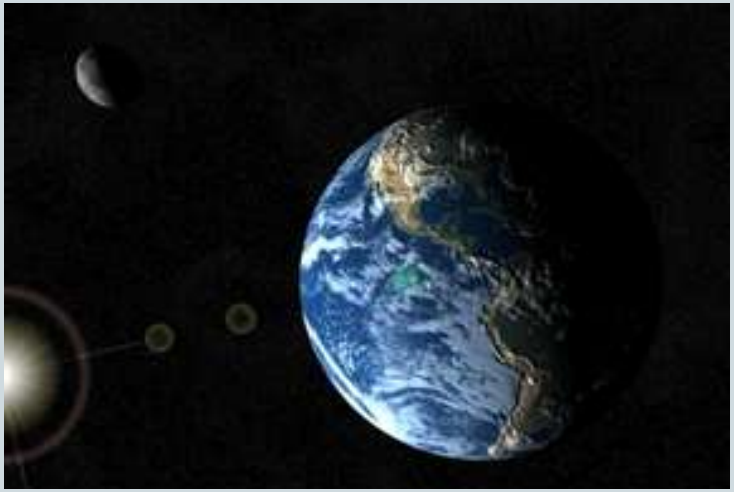
- **Cycle Ergometer**
  The cycle ergometer is similar to a stationary bicycle. The astronaut uses clip pedals and has the option of waist straps, back supports, and hand holds to secure themselves to the machine.
- **Treadmill**
  The treadmill requires a subject-loading device to secure the astronaut to the treadmill. The device consists of two spring-loaded cords that come from either side of the treadmill, which attaches to a harness around the astronaut's waist.
- **Resistance Exercise Device (RED)**
  The RED consists of a pair of canisters attached to a pulley system and harness to substitute weightlifting on Earth. Astronauts can perform heel lifts, squats and deadlifts to strengthen the muscles that do not get much use in space. There is also an advanced form of this device.

Extra Information and Role of Exercise

- Astronauts participating in space shuttle missions exercise for approximately 30 minutes per day. Each astronaut's exercise routine is monitored, and can be adjusted if necessary based on his or her monthly fitness assessment. However, even with rigorous exercise, astronauts typically lose up to 0.4-1% of their bone density per month in space. Although astronauts gradually recover their muscle tissue and most of their bone mass when they return to Earth, it is important that they are strong enough to perform emergency procedures during landing.
- The role of exercise in space is to keep astronauts healthy and fit during their exploration and when they return to Earth.

Conclusion

Exercise and hygiene overlap because they both have to do with personal health. These topics support each other in many ways. They both help keep a person alive and healthy. The conflicts are, overcoming the differences of space and Earth. These differences include: no gravity, radiation, and extreme weather conditions.



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